DOCUMENT RESUME

ED 280 341 HE 020 156

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TITLE Designing a Student Outcomes Study: The Eastern New Mexico University Experience.
PUB DATE Jan 86
NOTE 24p.
PUB TYPE Reports - Descriptive (141)

EDRS PRICE MF01/PC01 Plus Postage.
DESCRIPTORS Alumni; *College Students; *Educational Assessment; *Evaluation Criteria; Graduate Surveys; Higher Education; Institutional Research; Knowledge Level; *Outcomes of Education; *Program Development; Skill Development; Student Attitudes; Student College Relationship; *Student Development; Values
IDENTIFIERS *Eastern New Mexico University

ABSTRACT

Experiences of Eastern New Mexico University in conducting a student outcomes study are described. After tracing the background of the study, the following outcome dimensions are described: knowledge outcomes, skills outcomes, attitudes and values, student relationship with the university, and occupational outcomes. The university's Student Impacts and Outcomes Committee proposed that the study begin with the entering fall 1986 freshman class, which was estimated to be about 600 students. The committee also recommended annual surveying of all entering freshman, second semester sophomores and/or first semester juniors, and graduating seniors. Committee recommendations for developing an outcomes study included: top administrative support and campus support is needed before trying to implement the study; the literature on various theories of student development and student outcome dimensions should be reviewed; and various data collection instruments for evaluating outcomes dimensions should be evaluated. Issues concerning data collection and reporting study results are addressed. (SW)

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Designing a Student Outcomes Study: The Eastern New Mexico University Experience

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Designing a Student Outcomes Study: The Eastern New Mexico University Experience

The American public used to accept the value of a college education without question. Most graduates acquired high level good paying jobs, were considered well-educated individuals, and seen as leaders of society. However, over the past two decades a number of major trends have changed how the general public views postsecondary education. First, due to the smaller traditional college student age population many institutions are now faced with unstable or declining enrollments. Second, fewer graduates are being offered high-level good paying jobs. Third, institutional costs are increasing while federal and state appropriations for postsecondary education are decreasing. This is especially true in New Mexico where enrollment, the growth of the state population, and the state general revenue are all unstable. Fourth, institutions have been expanding course offerings and degree programs while not phasing-out low and/or no demand programs. Fifth, education has moved away from the concept of the "educated person" and towards vocationalism -- the employability of graduates. Finally, the undergraduate curriculum has been slowly deteriorating to the point of complete disarray. Educational quality has been replaced by mediocrity and employability has become the criteria for success.

Public concern over these factors is being expressed through the demand for increased "accountability". This has prompted the questioning of the goals and objectives of postsecondary education in general and of specific institutions. As a result, institutions are studying the impact they have on their students and are trying to redefine the undergraduate experience in terms of quality and student involvement. Institutions are

under pressure to document both the cognative and affective impacts they have on their students while decreasing the institution's attrition rate and increasing academic quality. The issue of academic quality and student involvement has become so critical that it was the focus of the 1985 AAHE (American Association for Higher Education) national conference as well as the thrust of several nationally known reports. Concomitant is the fact that student assessment has become the theme of an untold number of postsecondary educational conferences. Also, states are starting to mandate or are considering mandating that institutions of postsecondary education assess the education they are providing and the impact they are having on their students.

A review of the relevant literature reveals a plethora of studies focusing on college students and what happens to them during and after attendance (see Feldman and Newcomb, 1969; Trent and Medsker, 1968; Astin 1977; Bowen, 1977; Lenning et al., 1974; and Pace, 1979). There is also an abundance of data focusing on student attrition and retention (see Astin, 1971 and 1975; Tinto, 1975; Pantages and Creedon, 1978; and Pascarella, 1982). While their results are consistent with each other, the above mentioned studies focus on national or institutionally specific results and cannot provide the specific data needed to make the difficult policy decisions facing other institutions. This literature review also reveals a lack of information on how to design an outcomes type of study to acquire the specific data needed and what data collection and test instruments are available for that purpose. Therefore, the purpose of this report is to help fill that void utilizing a case study approach of the experiences of the Student Impacts and Outcomes Committee at Eastern New Mexico University.

Backround

In January of 1985 the Office of Institutional Research, at the request of the President of Eastern New Mexico University, developed a proposal for a comprehensive longitudinal student impacts and outcomes study. The purpose of the proposal was to initiate discussion about such a project and to illicit input from all segments of the campus.

The proposal outlined five general topics as they related to conducting the study. First, the proposal presented a research design adapted from Ewell (1984). The initial design proposed for this study was to follow every fourth entering freshman class through their undergraduate experience at Eastern New Mexico University, collecting pre- and post-data at several points: (1) at the time of first enrollment; (2) at the end of the sophomore year; (3) at the time of graduation; (4) at the time of withdrawal, dropping out, or nonreturning; and (5) at approximately two to five years after graduating. Second, in order to build campus support for the study and to bring the wide source of institutional expertise to bear on the development of such a study, the proposal put forth the concept of a "Student Impacts and Outcomes Committee" consisting of representatives drawn from all concerned campus constituencies. Third, the proposal presented a review of a variety of baseline data collection instruments as well as providing some stimulus for further discussion on the appropriate types of data to collect. Fourth, the proposal presented a possible process for collecting data which focused on altering current student contact practices. Finally, the proposal presented a baseline budget for conducting such a study, using only the simplest of data collection instruments and following one class.

Once developed, the proposal for the study was presented to the Presidents Council for discussion and comment. At this time the President's Council

concurred that such a study was necessary and approve it for further development. The proposal was then shared with the Deans and Vice Presidents for more detailed discussion and to obtain names of potential committee members. These discussions continued for several months until there was enough support to appoint a committee to finalize the design and initiate the study.

The President, after careful consideration, appointed a committee consisting of: (1) a faculty representative from each college; (2) the dean of the college of liberal arts and sciences; (3) the associate vice president for student affairs; (4) the dean of admissions; (5) a representative from business affairs; and (6) a member of the institutional research staff. Once appointed the committee consisted of twelve individuals carefully selected so that they were not only representing a specific college, administrative division or constituency but also so that they were representing key campus committees as well as informal constituent groups. Later, the president of the student government, the president of the faculty senate, the director of the university testing center, and the chairperson of the university's general education committee were appointed as ex officio members of the committee. It was hoped that as the committee progressed with its work, discussion and awareness would overflow into other settings thereby heightening awareness of the study and the importance of the data to be collected.

The charge to the committee was four fold. First, the committee was charged with overseeing the study -- to protect its integrity. Second, the committee was to identify what data to collect, how to collect it, when to collect it, and then, how to report it. Third, the committee was charged with issuing timely and informative reports based on the analysis of the data. Finally, the committee was charged with making policy recommendations to the

Vice President for Planning and Analysis on issues highlighted by data analysis. While the charge to the committee is quite broad it is also quite specific -- the committee is to develop a study that will evaluate the undergraduate experience at Eastern New Mexico University and report data which will highlight curricular and policy changes necessary to improve that experience.

Classification of Outcomes

For the Eastern New Mexico University study, the initial proposal outlined a longitudinal comprehensive outcomes study (to track an entire entering freshman class from the time they apply to Eastern until they leave with a follow-up two to five years later) to be implemented on a four-year cyclical basis (that is, as one class is entering its senior year, the new entering freshman class will become the new study population). This type of study incorporates both the traditional attrition/retention design with the classical outcomes study, thereby providing a wealth of data about students. This type of research design provides data that can be analyzed to show trends, changes, and comparisons between classes. Data collection starts at the time the student first enrolls as an entering freshman.

With its charge defined and with the initial proposal as a starting point, the committee used the following four questions to guide its preliminary work.

1. What is the committee measuring?
2. What are the data sources?
3. What procedures does the committee need?

4. What general considerations should guide the process?

It quickly became apparent that there was insufficient time to finalize the design, select appropriate data collection instruments, develop the accompanying data collection processes, and then begin the study by the fall 1985 semester. Therefore, the committee elected to postpone initiation of the study for one year, while it investigated and developed a classification of desired outcomes, identified appropriate data collection instruments, devised data collection procedures and, evaluated data currently collected on campus.

To provide a sense of direction and to provide a theoretical base from which to operate it is necessary to develop a classification of desired outcomes which is appropriate for the institution (for a comprehensive discussion of diverse outcome classifications see Ewell, 1983; and Lenning, 1977). At Eastern New Mexico University, the committee decided to use the classification of possible outcomes developed by Ewell (1984) as its starting point. Ewell's classification consists of four dimensions:

1. Knowledge Outcomes
   the breadth and depth of knowledge

2. Skills Outcomes
   social functioning
   occupational/professional skills

3. Attitudes and Values
   personal goals and aspirations
   general attitudes,values, and satisfactions
   attitudes towards self
   attitudes towards others

4. Relationship with Society and with Particular Constituencies.
   relationship with educational institutions
   relationship with employers/industries
   relationship with professions
   relationship with family/community/society

Based on Ewell's classification, a slightly different classification was developed which better fit Eastern New Mexico University's data needs. This classification structure consists of five dimensions:

1. Knowledge Outcomes
   the general education component

2. Skills Outcomes
   area of specialization

3. Attitudes and Values
   personal goals and aspirations
   general attitudes,values, and satisfactions
   attitudes towards self
   attitudes towards others

4. Relationship with the University
   degree of involvement in educational experience
   enrollment patterns
   degree of satisfaction with educational experience
   curricular patterns
   participation in remediation

5. Occupational Outcomes
   alumni employment
   alumni attitudes about educational experience
   alumni continuing education experience
   alumni success

After further deliberation by the committee, the above five dimensions were then combined into three broad catagories: (1) General Knowledge Outcomes; (2) Discipline Based Outcomes; and (3) General Attitudes and Values Towards Self, Society, and the University. There is also an alumni study which will be conducted in the next two to three years.

Knowledge Outcomes. This dimension encompasses the breadth component of the undergraduate curriculum. Generally, students draw courses from the fine arts, humanities, physical sciences, and the social sciences. This component involves study in several subject areas and frequently aims to provide a common undergraduate experience for all students within an institution (Levine, 1978).

It quickly became obvious that before any thought could be given to how to evaluate the general education component of the undergraduate experience, that component had to be defined and the intended outcomes of that component established. At Eastern New Mexico University this is the current topic of the "General Education Committee" so the student outcomes committee has colaberated with the general education committee on this subject. The committee looked at and evaluated several different instruments for evaluating the "General Knowledge" component. The most viable options being the ACT(American College Testing Program), the SAT (Scholastic Aptitude Test) and the GRE (Graduate Record Exam) both developed by ETS (Educational Testing Service), the various versions of the CLEP (College Level Examination Program), and the ACT COMP (College Outcomes Measures Project). After careful consideration it appeared that the ACT COMP was the only instrument available that proposed to evaluate a students general education experience. It was determined that the GRE was simply not appropriate and that the use of the ACT or SAT as a pretest-posttest measure would only indicate how prepared for college graduating college seniors are.

In considering what parts of the ACT COMP to use the committee decided on the ACT COMP Objective instrument. The decision was based on the type of data the "objective form" provides and because of the extreme commitment of time, personnel, and money needed to implement the complete ACT COMP instrument. The committee decided to use the instrument as a pretest-posttest measure to determine student "growth' or "value added" in a student's first two years at Eastern New Mexico University. The "value added" concept being adapted form the work being done at Northeast Missouri State University (McClain, 1985). The instrument is to be administered to all entering freshman each fall and to second semester sophomores and/or first semester juniors.

Discipline Based Outcomes. This is, the depth component of the undergraduate experience. This component is supposed to provide students with a body of knowledge, methods of study, and practice appropriate to a given subject area (Levine, 1978). The major area of study focuses on a body of facts, theories, language, and methods of inquiry unique to the specialty. (Ewell, 1984)

There are several standardized instruments such as the advanced exams of the Graduate Record Examination (GRE) and the College Board/ETS Advanced Placement Examinations which cover some general discipline areas. However, these are relatively limited in scope and do not cover all discipline areas as they relate to the curricular offerings at Eastern New Mexico University. Therefore, the committee will work with the individual departments on campus to identify nationally normed examinations (such as the CPA exam) for certification or licensure which would be appropriate for degree recipients in that specialization. If there is no such exam and the GRE or ETS exams do not apply, the department in question will be asked to develop an appropriate measure (this is especially significant in the fine arts). The discipline based examinations will be administered to all graduating seniors each spring semester.

General Attitudes and Values. This dimension focuses on the noncognitive impacts of the undergraduate experience as well as how the student feels about the institution and the services offered. Therefore, this discussion is divided in to two parts: the first focusing on attitudes and values and the second focusing on the students relationship with the university.

Attitudes and Values: Ewell (1984) states that there appears to be four broad categories of affective outcomes: personal goals and aspirations, general value systems, attitudes towards self, and attitudes towards others.

Given the broad range of possible activity in each of the four categories, this dimension is the most difficult to work with. According to Pace (1985) there are few if any "personality tests" appropriate for assessing student outcomes because what the instruments measure are not actually related to educational objectives and because most personality traits are already "deeply embedded" by the time the student reaches college. However, Pace does suggest that three instruments do merit further consideration as part of an outcomes study: (1) Holland's Vocational Preference Inventory (1973); (2) Rokeach's Terminal and Instrumental Values Scales (1969), and (3) Heist and Yonge's Omnibus Personality Inventory (1962). There are also several other instruments which warrant further consideration (Mines, 1982). These are: the Reflective Judgement Interview, the Defining Issues Test, the Sentence Completion Test (to assess ego development), and the Student Development Task Inventory-2. Finally, the CIRP (Cooperative Institutional Research Program) provides an interesting array of data which can be most useful in assessing the undergraduate experience.

Unlike the other outcomes dimensions, this dimension is the most dependent upon and affected by the philosophical base and theoretical approach an institution has towards student development. That is, if personality inventories are used, the theoretical base upon which the inventory was developed makes a great deal of difference in how the results can be interpreted and applied. There is also a significant difference in the various theories of student development (i.e. Chickering's (1969) vectors of development as opposed to Perry's (1970) theory of development) and how an institution might apply them.

There is also another major consideration to be addressed when considering the evaluation of "student affective development". This concern focuses on the

institution's ethical and legal responsibilities and student rights as they pertain to first, conducting this type of assessment and second, as they relate to the institution's use of the data. Careful consideration must be given to these concerns and strict guidelines developed for the use and reporting of the data. Finally, confidentiality is imperative.

So far, the outcomes committee at Eastern New Mexico University has not been able to recommend the use of any instrument to assess any of the four broad categories in this dimension. In fact, this dimension has proven to be the most difficult but there has been some discussion among committee members that the CIRP instrument will provide adequately the type of data the committee is seeking in the affestive domain. However, major concerns focus on three topics: (1) as discussed above, the legal and ethical concerns; (2) concern over the impact the data might have with the state legislature; and (3) the institution's mission statement and the institution's responsibility towards this outcomes dimension.

Relationship with the University: This subcatagory focuses on the student's actual participation in the undergraduate experience and the students degree of involvement in and satisfaction with the undergraduate experience. This dimension has several components: student demographic data as well as interests and abilities; educational goals; academic patterns as they relate to remedial needs; completion patterns; curricular paths and changing majors; and patterns of involvement and use of services and facilities. This dimension is the most complex to work with, requiring the collection and analysis of diverse data.

Two agencies (the National Center for Higher Education Management Systems -- NCHEMS, and the American College Testing program -- ACT provide what can be best described as basic data collection forms with supporting data analysis and

reporting services. These materials are designed to support outcomes and retention/attrition types of studies. Some will provide a data tape for the user's own analysis as well as national norms for comparative data analysis. There is also a relatively new instrument developed by Pace (1984) which attempts to measure and report student "quality of effort" or the degree of involvement students have in their undergraduate experience. What is unique about this instrument is that it attempts to measure the quality of effort a student puts into using the facilities and opportunities an institution provides for student learning and growth. These opportunities and facilities range from classrooms, laboratories, dormitories, and cultural facilities to student organizations and associations, faculty contact, and social events.

However, before deciding on what survey instruments should be used an institution must look within itself and identify what data is already collected. It is usually the case that the institution is already collecting reliable student data that can support most of the analysis in this dimension. Of particular interest would be student transcripts and student demographic data. After this internal investigation has been done the survey material selected should be for the purpose of filling data voids and providing data to address a specific issue.

At Eastern New Mexico University, the internal search uncovered a wealth of student data but it also uncovered several limitations to the current student data system. As part of the committee's work, these limitations have been presented to the Vice President for Planning and Analysis and action is forthcoming to make the student data system more standardized and consistant. To supplement the current data routinely collected on campus, it was decided that the outcomes committee would spend the next year developing its own general student survey to collect data to assess the institutions impact on

this outcomes dimension. The survey would be developed around the data routinely collected around campus and serve as supplemental data and not as the cental data collection instrument for all student data..

Alumni Survey. This dimension focuses on the success of the graduates -- what are they doing after they graduate, are they "successful", what is their employment and/or educational history, and how do they view their undergraduate experience. In addition to the economic and occupational data alumni surveys could focus on what the individual contributes to society. Pace (1985) presents the following questions as possible focal points for alumni surveys:

1. What do college graduate contribute to the welfare of the of their community?
2. Do they participate in the political process that influence the quality of government?
3. Do they contribute to the cultural enrichment of the community?

There are several different ways to proceed as far as data collection forms are concerned. Pace (1983) provides examples of alumni surveys which have been developed and can be adapted to the specific needs of an institution (pace, 1985). Also both ACT and NCHEMS have alumni survey forms which are basically similar in content except that the ACT form allows for thirty additional questions while the NCHEMS forms allow for only fifteen. However, before an institution makes any commitment to an alumni survey the institution should once again look to the development office and the alumni offices on campus to see what data is routinely collected. If the focus is on the economic and occupation outcomes, this data is often routinely collected on campus and should provide the necessary information.

At Eastern New Mexico University, the committee is currently preparing a

comprehensive proposal for an extensive alumni survey to be conducted within the next two to three years. This survey will utilize the ACT Alumni Survey form to collect data on students who graduated from Eastern New Mexico University since 1970.

Design and Methodology

The institution must decide if the study will be a tracking study (following individual students through their undergraduate experience), a cross-sectional stratified random sample of students in one academic year (this is often referred to as a simulated longitudinal study), or some mixture of the two. The main problem with longitudinal tracking studies is the time factor involved before any "outcomes" data is provided. Data provided in the first two years will be retention data with outcomes or impact data coming in the last two years. This is not to discount the importance of retention data, but to note that the benefit of such research is long-term not short-term.

At Eastern New Mexico University, the study being proposed is an annual simulated longitudinal outcomes study. The study is being designed to collect ACT COMP data from all freshman entering each fall semester as well as from all second semester sophomores (each spring semester) and/or first semester juniors (each fall), and to collect discipline based measure from graduating seniors each spring semester. The general student survey will be distributed at all data collection points. This type of study incorporates both the traditional attrition/retention type of study and the more classical outcomes type of research and utilizes the "value added" approach used at Northeast Missouri State University (McClain, 1985). The benefit to this type of design is that each year there is immediate and current data on entering freshman, first

semester juniors, and graduating seniors that can feed back to recruiting, curricular planning and program review, the development of necessary remedial programs and other academic support services, the development or modification of various student services, and budgeting and policy development. At the same time, due to the testing of all entering freshman each fall, it is possible to conduct cohort studies to develope a detailed database on institutional change and student development as well as providing data that can be used to perform comparative analysis between types of students.

The Study Population

The single greatest potential for problems with an outcomes study rests with the assurance of a large enough sample of students. Therefore, serious consideration must be given to sample selection. For an outcomes type of study, institutions are drawn between two conflicting forces -- limited resources on the one hand and solid research practices on the other. It is important that an adequate study sample be identified and, especially with the longitudinal component, if a sampling approach is used, that the sample be large enough to insure that by the senior year the study sample is still viable.

At Eastern New Mexico University, the Committee is proposing that the study commence with the entering Fall 1986 freshman class which is estimated to be approximately 600 students. The committee is also recommending annual surveying of all entering freshman, second semester sophomores and/or first semester juniors, and graduating seniors.

Data Collection

Once it has been decided what data to collect the next step is to develop the actual data collection procedures. There is no right or wrong when it comes to the procedures to use. Issues of concern and decision focus on: should student participation be mandatory, who should pay for data collection (both through hard funding and manpower), what office or person should be responsible for overseeing the processes, and when during the academic year should the data be collected.

When to collect the data is a complex task but, once developed and refined, will seem simplistic. Data should be collected from entering students at the time they enter the institution -- preferably within the first few weeks of the fall semester. There should also be a date set aside a few weeks in to the semester to capture those who enroll late or were overlooked earlier. Data should be collected from the officially withdrawing student at the time of withdrawal and data collected from the nonreturning and unofficially withdrawing students as soon as they are identified. The latter group should be contacted by phone if possible since they are not likely to answer a survey sent in the mail. Data on the graduating students should be collected close to the time they are cleared to graduate. It stands to reason to have data collection for this group as early in the semester as possible. The closer to commencement the more questionable the data becomes because of the students "state of mind". Finally, data to be collected on the first semester junior is best collected at the time they physically enroll for the designated semester.

A more crucial issue then becomes, with data collection occurring at different points in the university and since it cuts across administrative units, who is ultimately responsible for both the process and the data. The

most straightforward approach is to have the Institutional Research Office assist in designing all data collection processes. Once these procedures have been implemented the directors of the respective offices should be responsible for collecting the data as well as responsible for forwarding the collected data to the Institutional Research Office. If standardized tests or exams are used, the institution's testing service has the necessary expertise and experience to handle all aspects of the necessary testing. If participation is mandatory, the person responsible for student records and transcripts has the expertize necessary to help with the notification of students to be surveyed and to identify nonparticipants.

Finally, there is the issue of how to get the students to participate, Possibilities range from making participation a mandatory requirement for graduation to making participation optional. However, if participation is optional, there needs to be some form of incentive which will encourage students to participate such as a free lunch and movie or some other incentive.

At Eastern New Mexico University student participation will be mandatory but appropriate sanctions have not been identified. The university testing center will be respnsible for the aministration of the ACT COMP while theinstitutional research office will oversee the general student survey. The director of student records and registration will be responsible for identifying student who need to participate and working in conjunction with the testing center to schedule students for testing. Finally, the actual data collection instruments and procedures are to be phased in over a three year period. The first year focusing on the ACT COMP (starting with the Fall 1986 semester), year two will focus on the general student survey, and year three will be the addition of the discipline based measures. This three year phase-in period allows for the evaluation of the extra demands placed on students by the

addition on another data collection form as well as the evaluation of the various procedures and the data collected.

Reporting Results

One of the most pressing concerns about a student outcomes type of study focuses on the the difference between analysis and evaluation for the purpose of improvement as opposed to analysis and evaluation for the purpose of chastizing and budget reduction. Hopefully, an institution undertaking such a complex task as conducting a student outcomes study is doing so for reasons of improvement. In this light the key to preserving this attitude of improvement hinges on the way findings are presented to the campus. It is imperative that if results are interpreted it be done so on a very general bases (unless gross deficiencies or distinct issues are highlighted).

The outcomes committee at Eastern New Mexico University is intrigued with the practice used at Northeast Missouri State University in which graphic representation of the data is distributed throughout the institution. It is left to the individual to interpret the results. This type of reporting system is far less threatening and nonconfrontational than the generation of interpretative results. However, before data results are presented careful consideration should be given to why the results are being presented the way they are and possible reactions.

Summary and Conclusions

The purpose of this report has been to provide some assistance to those who are currently attempting to design a student outcomes study. This has been

done by reporting the process that Eastern New Mexico University has gone through in the last thirteen months. The experiences of the Student Impacts and Outcomes Committee at Eastern New Mexico University has shown that the following topics must be addressed and resolved in the development of any outcomes study.

First, top administrative support is essential for the success of such a study. The Student Impacts and Outcomes Committee at Eastern New Mexico University was exceptionally fortunate that the administration was the actual initiator of the study and did not need to be encouraged to support the study.

Second, illicit campus support before you try to implement the study. More importantly, develop an institution-wide committee to design the study and to oversee all its aspects. This committee will provide the means for institutional support for the study as well as the means to distribute the findings.

Third, do not try to develop the perfect research design, this will be an act of futility. Use sound research and assessment practices and recognize all the limitations unique to the particular setting. By following sound research and assessment techniques and common sense, most limitations are worth living with when one considers the value of the data to be collected.

Fourth, spend time at the outset reviewing the literature on the various theories of student development and student outcome dimensions. Then compare this review to the institution's mission and to the initial purpose for conducting such a study in order to develop a theoretical base and classification scheme of student outcomes that best fits the institution. Do not simply transpose what another institution is doing.

Fifth, evaluate the various data collection instruments as they relate to

the outcomes dimensions developed for the institution. Also look to see what data instruments have been developed by other institutions which could be adapted. Given the renewed importance of evaluating student outcomes and student involvement, there are certain to be new instruments developed so it is important to constantly review the literature on student outcomes to identify new developments which might be of use.

Sixth, spend ample time in designing the actual study, giving special consideration to: (1) determining if the study is to be a longitudinal tracking study, an annual study, or a combination; (2) the number of students and which students are to be included; and (3) the data collection procedures. If these issues are not resolved the study might well have serious validity and reliability weakness which will raise serious doubts about any findings reported.

Seventh, evaluate the data the institution routinely collects. Most likely, the instituion is already collecting most of the data being sought but perhaps the data is not in an easily usable form or just not being reported. In either case, the existing data bases will provide an excellent starting point in determining what additional data needs to be collected. Then determine how to store the data and manipulate it.

Finally, be careful not to present the study or report findings in a threatening or punitive manner. The major purpose for such a study is to improve the academic quality of an institution and enhance the undergraduate experience. To use such a study to point fingers or lay blame for institutional ills will not create the institutional climate necessary to improve the undergraduate experience. This is not to say that the data should not drive policy decisions, for in most cases the data will. Findings need to drive improvement not create barriers to change.

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